SAMPLING PLAN

TRI-STATE MINT/BERESFORD FACILITY

HUDSON, SOUTH DAKOTA

TDD #F08-9102-05 - PAN #FSD0057SAA

EPA ID # SDD982572281

EPA SITE ASSESSMENT MANAGER: PAT SMITH

E & E PROJECT OFFICER: JOHN H. BROWN, JR.

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DATE SUBMITTED: JUNE 12, 1991

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REGION VIII

ENVIRONMENTAL PROTECTION AGENCY

FIELD INVESTIGATION TEAM

APPROVAL PAGE

John H Brown Jr — 5/31/91

ECOLOGY AND ENVIRONMENT, INC. — DATE
FIT PROJECT OFFICER

6/3/91

ECOLOGY AND ENVIRONMENT, INC. — DATE
FIT OFFICE MANAGER

EPA FIT SITE ASSESSMENT MANAGER — DATE

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HUDSON, SOUTH DAKOTA
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1.0 INTRODUCTION

Under the provisions of Technical Directive Document (TDD) F08-9102-05 the Region VIII U.S. Environmental Protection Agency (EPA) tasked the Ecology and Environment, Inc. Field Investigation Team (FIT) to perform a screening site inspection (SSI) at the Tri-State Mint/Beresford site located four miles west-southwest of the town of Hudson in Lincoln County, South Dakota.

This sampling plan has been prepared to partially satisfy the requirements of the aforementioned TDD. It is designed to guide field operations during the SSI. The SSI field work will include sampling and non-sampling data collection. Samples of subsurface soils, sediment and ground water will be collected. Sampling procedures will adhere strictly to the requirements established in the Region VIII FIT Standard Operating Procedures (SOP III-2) for Field Operations at Hazardous Waste Sites.

Sample collection will consist of two sediment samples, nine soil samples, one ground water sample, and two quality assurance (QA) samples. The samples collected will be analyzed for hazardous substance list (HSL) metals and cyanide.

2.0 OBJECTIVES

The purpose of this SSI is to gather information pertinent to the evaluation of this site using the Hazard Ranking System (HRS) model

(Office of the Federal Register 1991). The specific objectives of this SSI are as follows:

- Identify and characterize waste attributable to this site;

- Document observed release of site contaminants to area ground water and the surface water pathway;

- Evaluate soil exposure potential; and

- Evaluate human target populations potentially impacted by this site.

3.0 BACKGROUND

3.1 SITE LOCATION

The Tri-State Mint/Beresford facility is located four miles west-southwest of the town of Hudson in Lincoln County, South Dakota. The site is a farm which was the previous location of the Tri-State Mint Refining Company operations prior to the facility's move to Sioux Falls, South Dakota. The site is located in the midst of sparsely populated farmlands, with croplands surrounding the site. An unnamed intermittent stream, directly adjacent and bordering the southeastern edge of the site, flows into the Big Sioux River approximately four miles away. The nearest residence is approximately 0.33 miles south of the site and two schools (McVay and East View) are located within one mile of the site. The town of Hudson, South Dakota, population 388, is located four miles east-northeast of the site. Hawarden, Iowa, population 2,722, is located approximately 14 miles downstream of the site along the Big Sioux River.

3.2 SITE DESCRIPTION

The Tri-State Mint/Beresford facility was involved in recovering precious metals, primarily silver, from photographic film and other materials through an unidentified leaching process since the early 1970s. Precious metal refining, smelting and fabrication operations were also allegedly conducted at this facility. This site is interrelated to several other Tri-State Mint sites in the Sioux Falls area, including Tri-State Mint/Avenue A and C and Tri-State Mint/Crooks. The site is currently owned by the Appaloosa Farms Company and is operated by Lorenz Opdahl, who also lives on the site. Prior to 1980, this site was the location of the Tri-State Mint facility. According to Opdahl, Bob Hoff, president of Tri-State Mint, took the business over from him in approximately 1980-1981 and then changed the refining operation to include the silver leaching process. A by-product liquid, potentially containing cyanide, was supposedly discharged into and around an onsite septic cistern between the production building and Opdahl's residence (Figure 1). This practice occurred until the company was moved from the farm site to 1600 "A" Avenue, Sioux Falls, South Dakota. The cistern has since been filled in.

3.3 SITE HISTORY AND PREVIOUS WORK

The Technical Assistance Team (TAT) of EPA's Emergency Response Branch (ERB) became involved with the Tri-State facilities through an emergency response activity in Sioux Falls, South Dakota, January 31, 1989. TAT investigated and performed an initial site assessment of a spill of green-tinted liquid reported to the South Dakota Department of Water and Natural Resources (SDDWNR). The spill, which appears to have been an illegal disposal incident of a solution containing high levels of cyanide and heavy metals, occurred at 1408 Avenue C; outside a warehouse which was leased by Tri-State Mint. As a result of the investigation at Avenue C, the EPA received additional reports from SDDWNR and the Sheriff's office alleging other incidents of possible illegal disposal by Tri-State Mint at three other locations in southeastern South Dakota, including the Beresford facility.

A site visit to the Beresford facility was conducted by the EPA-ERB and SDDWNR representatives on May 18, 1989 as a result of this additional information.

3.4 SITE GEOLOGY

The regional topography of the Greenwood area is largely characterized by the bluffed Big Sioux River drainage. The topography of southwestern Lincoln County consists of hummocky uplands and stream dissected highlands underlain by a thick mantle of loess. These uplands are characterized by many small boulder-strewn knobs and ridges. Many of the depressions separating the knobs and ridges are undrained and contain small lakes or sloughs. In eastern Lincoln County, the uplands have a gently rolling topography on which an integrated drainage pattern has developed. These less rugged areas generally mark the courses of ancient stream valleys now partially filled with glacial debris (Ellis 1965).

The surficial deposits of the Hudson area are chiefly the result of glaciation that occurred late in the Pleistocene Epoch. The glacial deposits are collectively termed drift and consist of end-moraine, ground-moraine and outwash deposits, which overlie Cretaceous shale and Precambrian quartzite. Small deposits of alluvium consist of sand, medium silt and clay which locally may contain gravel, cobbles or boulders. Drift includes unstratified material (till) and stratified deposits. The till in the area of study consists of clay and silt-sized particles mixed randomly with sand, pebbles and boulders which were deposited directly by the ice. Outwash sediments, which consist chiefly of sand and gravel with minor amounts of silt and clay, were deposited by meltwater streams from wasting glaciers. Outwash sand and gravel may be buried by glacial till, in which case the outwash is referred to as "buried outwash". Small deposits of stratified sand and gravel occurring in the till are referred to as sand lenses (Ellis 1965).

3.5 SITE HYDROGEOLOGY

Most ground water is obtained from outwash deposits, from sand and gravel lenses in moraine deposits and from the Big Sioux alluvium. Moderate to large amounts of water may be obtained from the outwash deposits where they consist of 20 or more feet of saturated sand and gravel. Outwash deposits consisting of less than 20 feet of saturated sand and gravel usually yield small to moderate amounts of water. Sand and gravel lenses in moraine deposits commonly yield small amounts of water, adequate for domestic and stock use, but with no potential for large yields. Water from these aquifers is of fair quality and is slightly saline to saline and very hard (Ellis 1965).

Recharge to the aquifers in outwash materials is by direct infiltration of precipitation and surface runoff. The amount of recharge that infiltrates into the zone of saturation depends on vegetation, topography, soil type and structure, rate of evaporation and the duration, type and intensity of precipitation. Ground water is discharged from the aquifers by ground water outflow, discharge from wells and springs, seepage into surface water bodies, evaporation from the soil where the height of ground water is at or near the land surface and plant transpiration.

3.6 SITE HYDROLOGY

Surface water in the Tri-State Mint/Beresford area exists as large rivers, small ponds and intermittent or ephemeral streams. The main water body is the Big Sioux River, which flows south. Flow in the Big Sioux River at Akron, Iowa is approximately 982 cubic feet per second (Hoffman 1986). An unnamed intermittent stream flows along the southwestern edge of the site and into the Big Sioux River approximately four miles southeast of the site (Figures 1 and 2).

4.0 <u>PRELIMINARY PATHWAY ANALYSIS</u>

4.1 WASTE CHARACTERIZATION

Liquid by-products potentially containing high concentrations of cyanide and heavy metals have supposedly been discharged into and around a septic cistern located onsite. A potential exists that these contaminants, and other unknown onsite contaminants, have migrated into the underlying aquifer. Waste quantity is unknown. Waste states may include sludges and solids. Onsite waste may exhibit characteristics of toxicity, persistence and corrosivity.

4.2 AIR MIGRATION PATHWAY

Due to the volatile nature of the cyanide solutions potentially used in onsite operations and due to two external furnaces observed onsite which were potentially used for incineration and smelting operations, past releases of CERCLA contaminants could have occured to the air pathway. Approximately 820 people live within four miles of the site and potentially could have been affected.

4.3 GROUND WATER MIGRATION PATHWAY

Liquid by-products of onsite operations, potentially containing high concentrations of cyanide and heavy metals, have reportedly been discharged into and around an onsite septic cistern (Ecology and Environment, Inc. 1990). In addition, an open discharge pipe was observed in the south wall of an onsite shed which housed the metal recovery operations. The purpose of the pipe is currently unknown; however, the ground beneath the pipe was observed to be irregular, suggesting the potential for a buried object. A potential exists that these above-mentioned and other unknown onsite contaminants have migrated into the underlying aquifer. Ground water in the area is used for domestic, stock and irrigation purposes. Little information exists about the aquifers underlying the site or the domestic and stock wells located within four miles. A domestic well located onsite supplies the Opdahl residence with drinking water and classifies as the nearest residence. A second well is reportedly located several hundred yards downgradient of the site adjacent to an intermittent stream channel. No information is available concerning the construction of these wells. Approximately 820 people living within four miles of the site use ground water as a domestic water supply and are potentially affected.

4.4 SURFACE WATER MIGRATION PATHWAY

Onsite surface runoff flows mainly toward the southeast and toward an unnamed intermittent stream located on the southeastern edge of the site. This stream flows east-southeast for four miles, where it joins the Big Sioux River, which flows south and defines the South Dakota-Iowa state border. The Big Sioux River is used for recreational fishing, since it is one of the few rivers in South Dakota that flows continually year round. Oak Grove Iowa State park is located approximately six miles downstream of the site along the Big Sioux River and the town of Hawarden, Iowa, population 2722, is located approximately 14 miles downstream of the site. The river is reportedly use for irrigation purposes. The water quality is too poor to be used for domestic or municipal purposes. A total of 52 irrigation surface water intakes are reported to exist downstream of the site in the Big Sioux River within Union County, South Dakota. A potential exists that contaminants from onsite industrial wastes and other unknown hazardous substances have migrated from the site via the surface water pathway and have potentially affected the above-mentioned targets.

4.5 SOIL EXPOSURE PATHWAY

Approximately 840 people live within four miles of the site and are potentially affected. Access to the site is not restricted. The site is the residence of the facility's operators, Lorenz and Tom Opdahl, and classifies as the nearest residence. The next closest residence is 0.33 miles south of the site and two schools (McVay and East View) are located within one mile of the site. The following federally endangered species are regarded as statewide migrants which may periodically occur on or near the site: peregrine falcon (Falco peregrinus), bald eagle (Haliaeetus leucocephalus), whooping crane (Grus americana) and eskimo curlew (Numenius borealis). The osprey (Pandion haliaetus), a statewide threatened species, is also a statewide migrant (South Dakota Department of Game, Fish and Parks 1989). Due to the potential that industrial wastes, solvents and pesticides are onsite on the surface of the ground and since no access restrictions exist, the potential exists that the above-mentioned targets have come in contact with these onsite contaminants.

5.0 FIELD OPERATIONS

5.1 CONCEPT OF OPERATIONS

5.1.1 Schedule

The FIT is anticipating field work to commence during June 1991. Sampling is likely to take two days. Non-sampling data collection will be undertaken as appropriate.

5.1.2 Safety

A hotline and personnel decontamination station (PDS) will be established during the site inspection. The extent and location of the PDS will be determined in the field based on site conditions and meteorological observations. It is expected that most site-related activities can be accomplished in Level D protection. Personnel protection levels will be upgraded if site conditions warrant. All field activities will be conducted in strict accordance with an approved site safety plan which will be developed prior to the field team's arrival onsite.

5.1.3 Site Access

The FIT will obtain access with the assistance of the EPA Region VIII site assessment manager. Access to offsite properties will be obtained by the FIT project officer as appropriate.

5.2 SAMPLING LOCATIONS

This SSI involves the potential collection of 14 samples. These samples will include the following: two sediment samples, nine soil samples, one ground water sample and two quality assurance blank samples. Table 1 describes sampling locations and rationale for individual samples. Figure 2 illustrates the proposed sample locations. Specific sample locations will be determined by the project officer based on site conditions.

One sediment sample will be collected from the drainage ditch where it enters the Beresford property on the upstream side and one sediment sample will be taken where the ditch exits the property on the downstream side.

The FIT will collect a total of nine soil samples at the Tri-State Mint/Beresford site. A sample from the northeast corner of the site will be collected to determine background conditions.

Two blank QA samples will be collected. One rinsate blank will be prepared to document the thoroughness of decontamination procedures for soil sampling equipment; one rinsate blank will be prepared to document ground water sampling decontamination quality.

5.3 SAMPLING METHODS

5.3.1 Soil Sampling

Soil samples will be collected following procedures described in SOP III-2, Chapter 9, Soil and Sediment Sampling. The FIT will use stainless steel hand augers and spoons for soil collection. All soil samples will be composited in decontaminated stainless steel or plastic buckets. All samples will be collected in a biased manner to provide information on maximum contaminant concentrations existing at the site. Specific sampling locations will be determined by the project officer. Samples will be collected to a two foot depth and will be composited by depth interval. Soil sampling locations will be photographed during the sampling event and each soil sample will be screened using an organic vapor analyzer at the time of collection. For all solid matrix sample collections, the area of sample collection will be monitored with a Ram-mini particulate sampler and appropriate action levels based on anticipated metals contaminants will be observed. Soil sampling locations are shown in Figure 2.

5.3.2 Sediment Sampling

Sediment sampling will be accomplished following SOP III-2, Chapter 9, Soil and Sediment Sampling. Sampling will generally be conducted using stainless steel or plastic spoons or scoops. Sampling locations will be photographed and an organic vapor analyzer will be utilized to screen each sample at the time of collection.

5.3.3 Ground Water Sampling

Ground water sampling will follow protocol described in SOP III-2, Chapter 8, Water Sampling. The FIT will sample the private drinking water well located onsite. The FIT is anticipating this well to have a dedicated pumping mechanism. The field team will be prepared to utilize PVC or Teflon bailers for sampling this well if a dedicated pumping mechanism is absent.

This well will be purged according to SOP III-2, Chapter 8 protocol. At least three casing volumes or three casing volumes plus any holding tank volumes will be purged. Prior to sample collection, water will be run for a minimum of 15 minutes until temperature, pH, and specific conductance have stabilized.

The FIT will collect both filtered and non-filtered drinking water well samples. Each dissolved metal fraction of the ground water monitoring well sample will be field filtered using a 2.4 liter barrel filter with a 0.45 micron membrane filter. All sampling locations will be photographed during sample collection. Additionally, the FIT will screen each sample using an organic vapor analyzer and will measure the pH, specific conductance and temperature of each ground water sample collected.

Additionally, FIT will measure the suspended particles in water purged from the well. Samples will be collected after the appropriate purge volume has been removed, parameters have stabilized and the suspended particles are less than ten percent of the water volume.

5.4 CONTROL OF CONTAMINATED MATERIALS

Investigation-derived wastes generated during this SSI will be contained in accordance with FIT SOP III-2, Chapter 13, Control of Contaminated Materials. An investigation-derived waste management disposal plan will be developed and included in the Site Safety Plan. Contained wastes will be segregated by type and source and will be labeled. All disposable sampling equipment and disposable personal protection outerwear will be drummed, if necessary. The FIT will request that the facility allow any contaminated soil and water to be disposed of onsite. However, the field team will be prepared to contain any material which may prove to be contaminated.

5.5 ANALYTICAL PARAMETERS

Table 1 describes the sample type, location and rationale for each individual sample to be collected. Table 4 represents the Sample Plan Checklist describing the analytical parameter for each sample.

Samples collected for this SSI will be analyzed for regular analytical services (RAS) inorganics and special analytical services (SAS) inorganics. The EPA Contract Laboratory Program (CLP) will be utilized in accordance with the laboratory QA guidelines referenced in the FIT Quality Assurance Project Plan (QAPP) for Site Inspections (Ecology and Environment, Inc. 1989).

Calibration and operation of the pH and conductivity meters will follow instrument manufacturer's instruction manuals and SOP III-2, Chapter 7, Field Measurements. Soil sampling will proceed from areas of least to suspected highest contamination. Ground water will be collected from a private well in accordance with SOP III-2, Chapter 8, Ground Water. All non-disposable sampling equipment will be decontaminated prior to and following collection of each sample as described in SOP III-2, Chapter 11, Equipment Decontamination Procedures. The decontamination will consist of a tap water wash, soapy water wash, tap water rinse, triple acetone rinse (if organics are suspected), air drying, triple deionized water rinse, air drying and wrapping equipment in plastic to prevent any potential contamination. Performance and system audits may be conducted according to the procedures described in the QAPP (Ecology and Environment, Inc. 1989).

5.6 QUALITY ASSURANCE

The following samples will be provided for quality assurance:

- One field rinsate blank per day sampling; per environmental media (liquid and solid);
- One duplicate water matrix sample per set of 20 water samples shipped. One will be required for this SSI;
- One triple volume liquid matrix spike-matrix duplicate water sample per set of 20 samples shipped. One will be required for this SSI;
- One background sample for each sample matrix;
- Sample splits will be provided to site owners, if requested.

5.7 CHAIN OF CUSTODY

After sample collection and identification, all samples will be handled in strict accordance with chain of custody protocol prescribed by the NEIC Procedures Manual for the Evidence Audit of Enforcement Investigations by Contractor Evidence Audit Teams, April 1984 (EPA-300/9-81-003R).

6.0 SAMPLING REPORT

Following the completion of all sampling activity, the FIT will prepare a Draft Site Inspection Report (DSIR). This report will detail all sampling and non-sampling data collection which have been performed as part of this TDD.

7.0 REFERENCES

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Sax, N.I. and R.J. Lewis, Sr., 1989, Dangerous Properties of Industrial Materials, 7th Edition, New York, NY.

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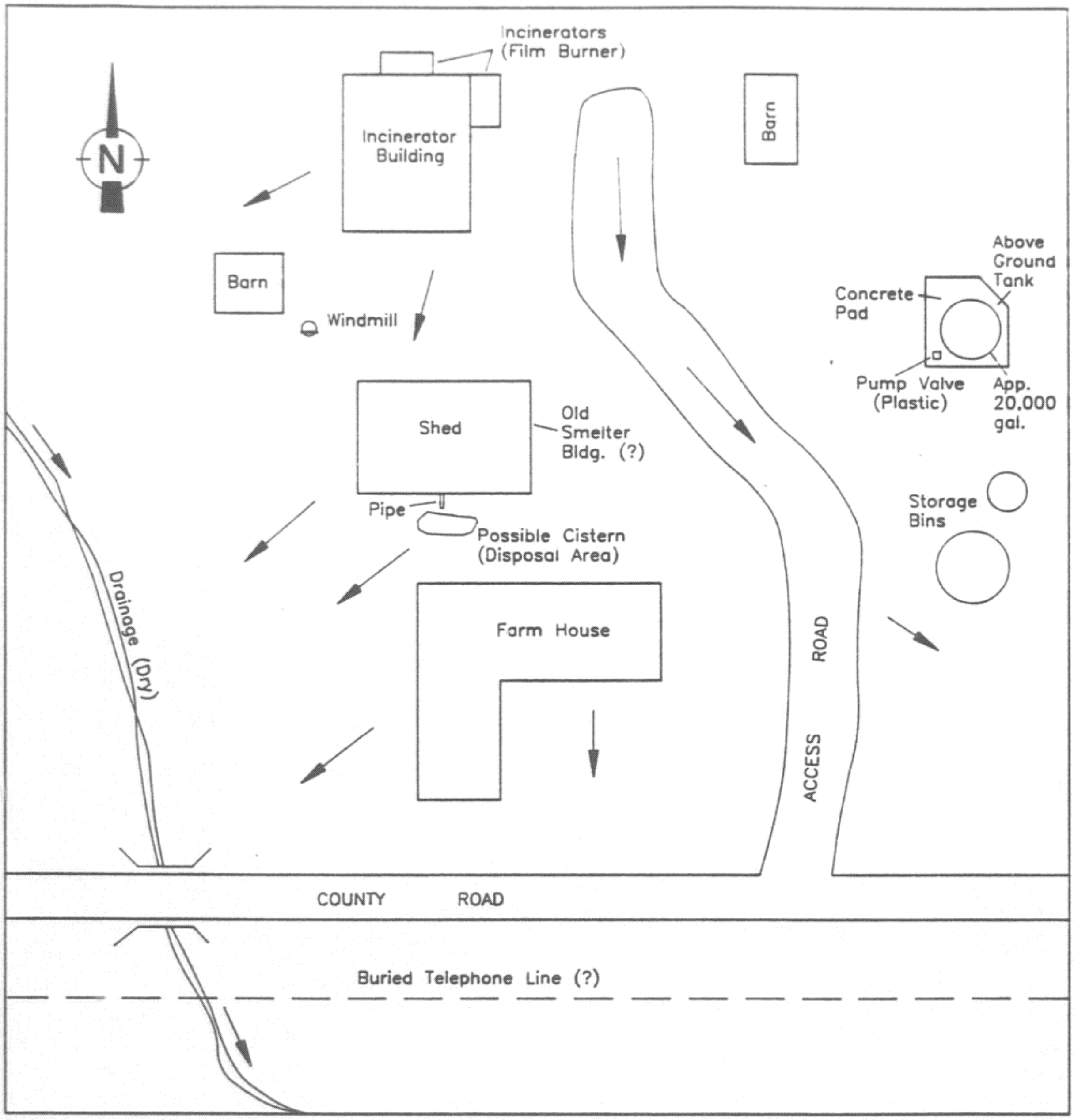
Steece, Fred V., 1965, Illinoian Age Drift in Southeastern South Dakota, Bulletin No. 7, South Dakota State Geological Survey, Vermillion, SD.



LEGEND

Flow direction

FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES
TASK REPORT TO THE E.P.A.

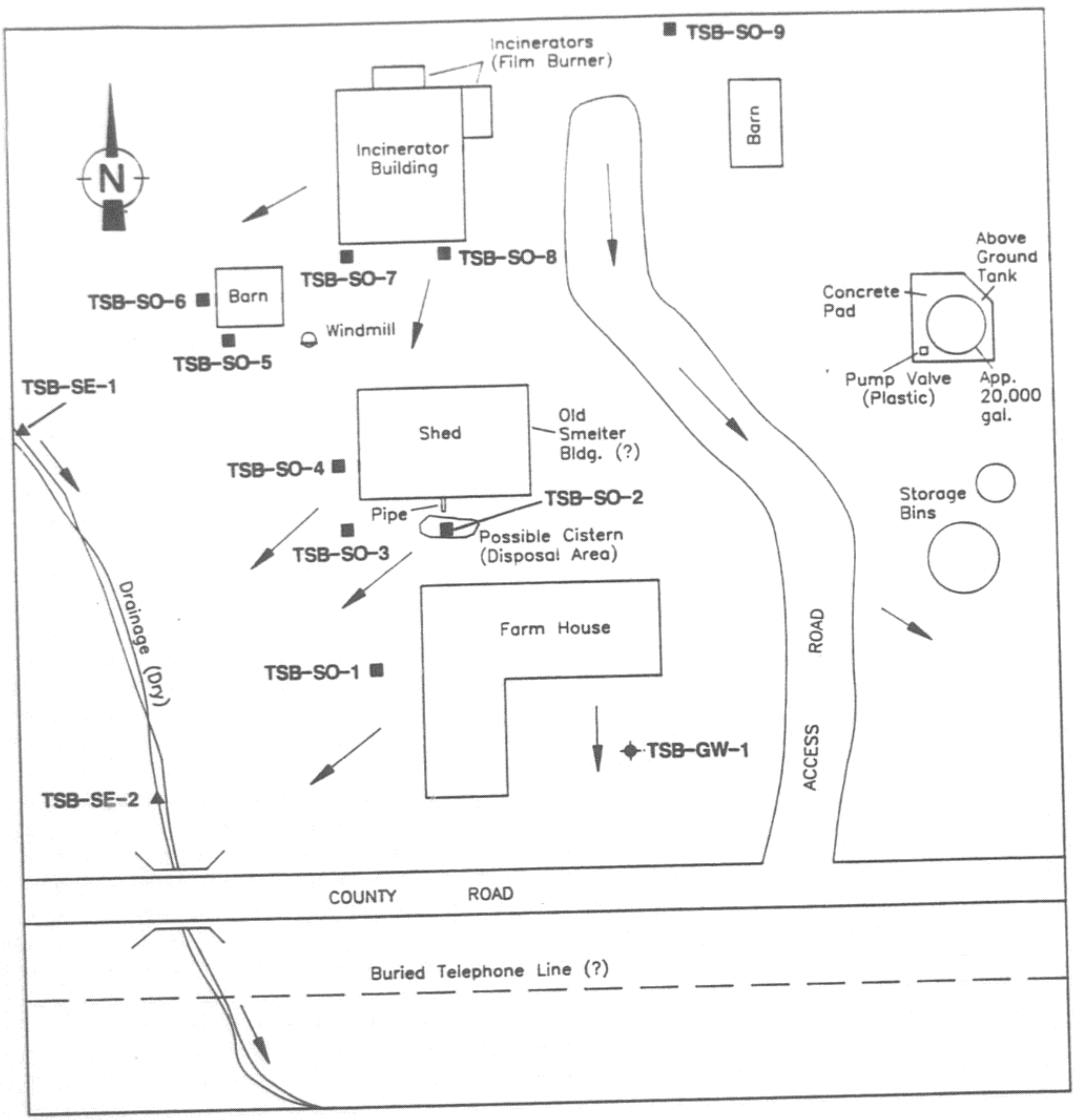
TITLE: TRI-STATE MINT/BERESFORD
Beresford, South Dakota
DETAILED SITE LOCATION MAP

T.D.D. F08-9102-05

ecology & environment, inc.
DENVER, COLORADO

FIG. 1

Date: 06/89 Drawn by: RSM Scale: NTS



LEGEND

Flow direction

Soil sample

Sediment sample

Groundwater sample

FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES
TASK REPORT TO THE E.P.A.

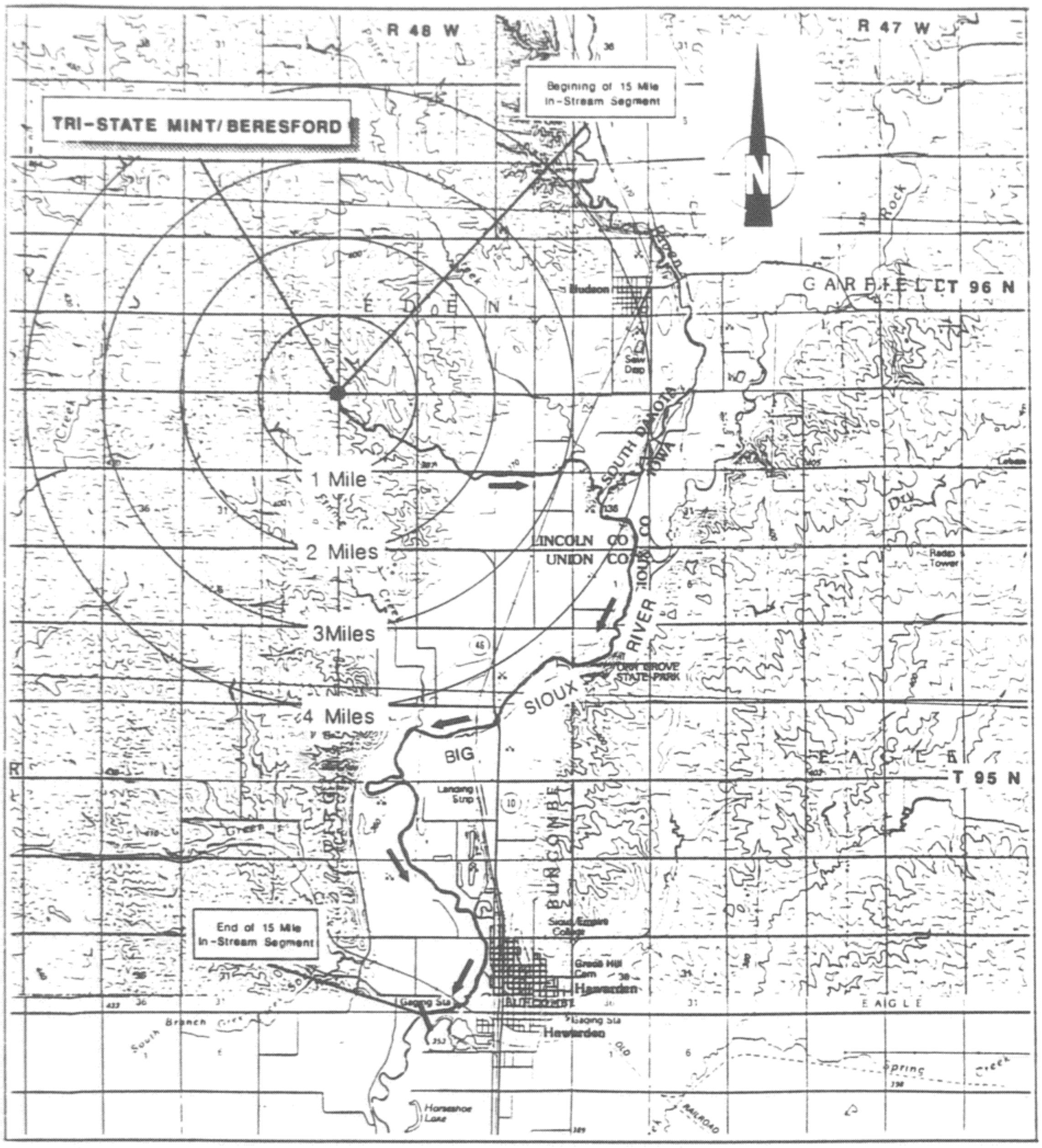
TITLE: TRI-STATE MINT/ BRESFORD
Beresford, South Dakota
SAMPLE LOCATION MAP

T.D.D. F09-9102-05

ecology & environment, inc.
DENVER, COLORADO

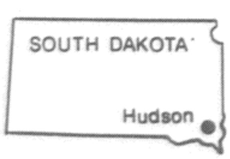
Fig. 2

Date: 06/89 Drawn by: RSM Scale: NTS



1 2 3 4 5 Miles

LOCATION MAP



LEGEND

● Site location

→ Direction of flow

Source: Sioux City Topographical, South Dakota 1986

FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES
TASK REPORT TO THE E.P.A.

TITLE:
TRI-STATE MINT/ BERESFORD
Hudson, South Dakota
RADIUS OF INFLUNCE MAP

T.D.D. F08-9102-05

ecology & environment, inc.
DENVER, COLORADO

FIG. 3

Date: 05/90 Drawn by: KJE Scale: ________

TABLE 1
SAMPLE TYPES, LOCATIONS AND RATIONALES
TRI-STATE MINT/BERESFORD FACILITY
HUDSON, SOUTH DAKOTA
TDD #F08-9102-05 - PAN #FSD0057SAA

SAMPLE MATRIX	SAMPLE #	LOCATION	RATIONALE
GROUND WATER	TSMB-GW-1	Private onsite well	Determine if shallow aquifer is contaminated
SEDIMENT	TSMB-SE-1	Beginning of onsite drainage ditch (intermittently dry)	Determine if onsite contaminants have migrated into SW pathway
	TSMB-SE-2	End of onsite drainage ditch (intermittently dry)	Determine if onsite contaminants have migrated into SW pathway
SOIL	TSMB-SO-1	Northwest side of farmhouse	Characterize nature and volume of contaminants onsite
	TSMB-SO-2	Cistern at south end of shed	Characterize nature and volume of contaminants onsite
	TSMB-SO-3	Northwest corner of shed	Characterize nature and volume of contaminants onsite
	TSMB-SO-4	West side of shed	Characterize nature and volume of contaminants onsite
	TSMB-SO-5	South end of barn	Characterize nature and volume of contaminants onsite
	TSMB-SO-6	West side of barn	Characterize nature and volume of contaminants onsite
	TSMB-SO-7	Southwest end of incinerator	Characterize nature and volume of contaminants onsite
	TSMB-SO-8	Southeast end of incinerator	Characterize nature and volume of contaminants onsite
	TSMB-SO-9	Northeast edge of property	Background
RINSATE BLANK	TSMB-SW-1	Collected at command post by pouring organics free and metals free water over decontaminated sampling equipment	QA/QC
	TSMB-SW-2	Collected at command post by pouring organics free and metals free water over decontaminated sampling equipment	QA/QC

TABLE 2
NON-SAMPLING DATA COLLECTION RATIONALE
TRI-STATE MINT/BERESFORD FACILITY
HUDSON, SOUTH DAKOTA
TDD #F08-9102-05 - PAN #FSD0057SAA

DATA ELEMENT	DATA COLLECTION STRATEGY AND RATIONALE
	*** **WASTE CHARACTERISTICS** ***
Photograph Contamination	Locate and photograph visible contamination to aid in identifying waste type and state.
Measure Contamination	Measure areas of visible or known contamination to aid in the determination of waste quantity.
Waste Containers	Document type and size of waste containers in order to characterize and quantify potential onsite wastes.
	*** **GROUND WATER PATHWAY** ***
Nearest Well	Identify the nearest well and measure its distance from the site to provide data on nearest well.
Ground Water Usage	Determine ground water usage within four miles of this site to provide data for overall ground water pathway scoring.
	*** **SURFACE WATER PATHWAY** ***
Containment	Identify and characterize drainage pattern between the site and the Big Sioux River. This will include documenting any run-on and run-off controls, site slope/direction and area soil and vegetation types to verify the adequacy of containment.
Sensitive Environments	Document presence and size of wetlands within 15 downstream miles of this site.

TABLE 2 CONT.
NON-SAMPLING DATA COLLECTION RATIONALE
TRI-STATE MINT/BERESFORD FACILITY
HUDSON, SOUTH DAKOTA
TDD #F08-9102-05 - PAN #FSD0057SAA

DATA ELEMENT	DATA COLLECTION STRATEGY AND RATIONALE
	*** SOIL EXPOSURE PATHWAY ***
Accessibility/Frequency of Use	Document site accessibility/frequency of use to provide data with which to assign an accessibility score.
Population	Estimate population densities within one mile of the site to aid in the documentation of onsite and nearby population totals.
Land Use	Document land use within four miles of the site in order to provide data to score this part of the soil exposure pathway.

TABLE 3
SAMPLE PRESERVATION AND BOTTLE REQUIREMENTS

LOW CONCENTRATION

Inorganic Metals (Water)	1 - 1 liter poly, HNO_3 to pH<2,
Metals (Solid)	1 - 8 oz. glass jar

TABLE 4
SAMPLE PLAN CHECKLIST
REGION VIII

Site Name: TRI-STATE MINT BERESFORD

Address:

City: HUDSON, SD County: Lincoln

TDD Number: F08-9102-05

Project Team Leader:

Sampling Date:

SAMPLE LOCATION	SAMPLE TYPE	FIELD PARAMETERS					LABORATORY PARAMETERS													
		Temp	pH	Cond	DO	Special	Task 1&2 Metals	Task 3 Cyanide	Task 3 Sulfide	Task 3 Ammonia	Special Anion	Special NO3&NO2	Special Inorganic	VOA	B/N/A Extract	Pesticide	Special Organic	Dup	Spike	Blank
TSMB-GW-1	WATER	✓	✓	✓			✓	✓										✓		
TSMB-SE-1	SEDIMENT						✓	✓												
TSMB-SO-1	soil						✓	✓												
TSMB-SO-2	″						✓	✓												
TSMB-SO-3	″						✓	✓												
TSMB SO-4	″						✓	✓												
TSMB SO-5	″						✓	✓												
TSMB-SO-6	″						✓	✓												
TSMB-SO-7	″						✓	✓												
TSMB-SO-8	″						✓	✓												
TSMB-SO-9	″						✓	✓												
TSMB-SW-1	WATER						✓	✓												
TSMB-SW-2	WATER						✓	✓												